

N<sup>o</sup> 14,955



A.D. 1893

Date of Application, 4th Aug., 1893

Complete Specification Left, 4th May, 1894—Accepted, 9th June, 1894

PROVISIONAL SPECIFICATION.

Improvements in or connected with Boots and Shoes.

I, FREDERICK ROBINSON, of Trent Works, Burton-on-Trent, in the County of Stafford, Engineer, do hereby declare the nature of this invention to be as follows:—

This invention has reference more particularly to those boots and shoes which are worn by athletes or by persons playing tennis, cricket and other out-door games but my invention is also applicable to boots and shoes generally.

My invention consists in the application of inflated or pneumatic india rubber or like flexible tubes to the soles and heels of boots and shoes so as to form an elastic tread, the said tubes being either detachable from the said soles and heels or not detachable and provided with a valve by which the tubes can be inflated or deflated at will.

The said pneumatic or inflated tubes may be arranged and connected to the said soles and heels in various ways for instance the sole of the boot or shoe may have an undercut groove or projecting ribs running round the under side of the same in an oblong or other suitable form and in this groove or between these ribs fits the pneumatic tube which may be like the endless inner india rubber or like air tube and the outer covering of a pneumatic tyre for wheels. There is a similar groove or ribs running round the underside of the heel and a similar pneumatic tube fitting therein. The sole tube and the heel tube are connected together by a small tube under the instep and in this small tube is the valve and connection for the pump when inflating the tubes so that both tubes are inflated together. Or the sole and heel tubes may be quite separate and distinct with separate valve to each or the same pneumatic tube may be arranged round both the sole and heel of the boot or shoe.

Or the sole and heel may be made as usual and the pneumatic tube or tubes be arranged to fit in a light metal or other plate or frame or plates or frames the edges of which are turned outwardly and inwardly so as to form the necessary undercut section to hold the pneumatic tube or tubes in place.

When made in this way the said metallic plate or frame or plates or frames can readily be removed from and replaced on the soles and heels of the boots or shoes thus enabling the boots or shoes to be changed from ordinary to pneumatic or from pneumatic to ordinary at will.

Or the pneumatic tube or tubes may be cemented or otherwise fixed to the sole and heel of the boots and shoes.

By "pneumatic tube" I mean any kind of india rubber or like flexible air tube whether made with a separate outer covering portion or not so made.

Dated this 2nd day of August 1893.

CHARLES BOSWORTH KETLEY,  
Agent for the Applicant.

[Price 8d.]

*Robinson's Improvements in or connected with Boots and Shoes.*

## COMPLETE SPECIFICATION.

## Improvements in or connected with Boots and Shoes.

I, FREDERICK ROBINSON, of Trent Works, Burton-on-Trent, in the County of Stafford, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

My invention has reference more particularly to those boots and shoes which are worn by athletes or by persons playing tennis, cricket and other out-door games but my invention is also applicable to boots and shoes generally.

My invention consists in the application of inflated or pneumatic india rubber or like flexible tubes to the soles and heels of boots and shoes so as to form an elastic tread, the said tubes being either detachable from the said soles and heel or not detachable and provided with a valve by which the tubes can be inflated or deflated at will.

The said pneumatic or inflated tubes may be arranged and connected to the said soles and heels in various ways for instance the sole of the boot or shoe may have an undercut groove or projecting ribs running round the under side of the same in an oblong or other suitable form and in this groove or between these ribs fits the pneumatic tube which may be like the endless inner india rubber or like air tube and the outer covering of a pneumatic tyre for wheels. There is a similar groove or ribs running round the underside of the heel and a similar pneumatic tube fitting therein. The sole tube and the heel tube are connected together by a small tube under the instep and in this small tube is the valve and connection for the pump when inflating the tubes so that both tubes are inflated together. Or the sole and heel may be quite separate and distinct with separate valve to each.

Or the sole and heel may be made as usual and the pneumatic tube or tubes be arranged to fit in a light metal or other plate or frame or plates or frames the edges of which are turned outwardly and inwardly so as to form the necessary undercut section to hold the pneumatic tube or tubes in place.

When made in this way the said metallic plate or frame or plates or frames can readily be removed from and replaced on the soles and heels of the boots or shoes thus enabling the boots or shoes to be changed from ordinary to pneumatic or from pneumatic to ordinary at will.

Or the pneumatic tube or tubes may be cemented or otherwise fixed to the sole and heel of the boots and shoes.

In order that my invention may be well understood I will now proceed to particularly describe the same by referring to the accompanying drawings on which

Fig. 1 is a longitudinal sectional elevation of a shoe with inflated or pneumatic india rubber or like flexible tubes applied to the sole and heel of the same;

Fig. 2 is an inverted plan of the same with portions of the pneumatic tubes removed so as the better to shew the fixing plates or frames of the same;

Fig. 3 represents in sectional elevation and in inverted plan the metal plate separately which secures the pneumatic tube to the heel of the said shoe;

Fig. 4 is a longitudinal sectional elevation of a portion of a shoe with the pneumatic tubes fixed to the sole of the same according to a modification of this invention and

Fig. 5 is an inverted plan of the heel portion of the shoe part of the indiarubber pneumatic tube being represented as being cut away to more clearly shew the groove in the heel of the shoe in which the said tube fits;

Fig. 6 is a longitudinal sectional elevation of a portion of a shoe with pneumatic tubes fixed to the sole of the same in a slightly different manner shewn by the preceding figs, and

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The same letters of reference indicate the same or corresponding parts in all the figures of the drawings.

I will first describe my invention as illustrated by Figs. 1, 2 and 3. A is the sole of the shoe made of india rubber or like air tube of the sole portion of the shoe and B<sup>1</sup> is its outer covering of india rubber or canvas insertion like the inner air tube and outer covering of a pneumatic tyre for wheels. This outer covering B<sup>1</sup> is made to surround or almost surround the inner air tube B<sup>1</sup> and is made with two beads, marked respectively b<sup>1</sup> b<sup>2</sup>, one along each edge which fit in the undercut recess c<sup>1</sup> of the thin metal plate or frame C which is by preference made of aluminium or some other light and thin sheet metal and fixed to the sole A by screws such as those shewn and marked d. It will be seen that the edges c<sup>2</sup> c<sup>3</sup> are raised and turned towards each other so as to form the necessary undercut section under which the beaded edges b<sup>1</sup> b<sup>2</sup> of the outer covering portion B<sup>1</sup> fit so as to be firmly secured when the inner air tube B<sup>1</sup> is inflated. E<sup>1</sup> is the endless inner india rubber or like air tube of the heel portion F of the shoe and E<sup>2</sup> is the india rubber and canvas insertion outer covering of the same; G is the thin metal plate or frame which is pierced with a central hole g<sup>1</sup> and the edges g<sup>2</sup> g<sup>3</sup> of the plate G are turned inwardly so as to form the necessary undercut section for the beaded edges e<sup>1</sup> e<sup>2</sup> of the outer covering E<sup>2</sup> to take under so as to be secured thereto when the inner air tube E<sup>1</sup> is inflated. The plate or frame G is secured to the heel as by screws d as shewn. It will be seen that the plate or frame G with its air tube E<sup>1</sup> and outer covering portion E<sup>2</sup> is (except as to shape) similar to the plate or frame C with its inner air tube B<sup>1</sup> and outer covering portion B<sup>1</sup>. Formed with the inner covering portion B<sup>2</sup> and is connected to one branch of the valve H, to the other branch of which a small india rubber air tube e<sup>3</sup> formed with the inner air tube B<sup>1</sup> is fixed. This valve H may be similar in construction to those used for pneumatic tyres for connecting to the pump to inflate the air tube so that by means of this valve both air tubes E<sup>1</sup> B<sup>1</sup> are inflated simultaneously. When it is desired to remove the metal plate C from the shoe the plate C is lifted from the sole A by means of the screws d.

When it is desired to remove the metal plates or frames C and G with the air tubes B<sup>1</sup> E<sup>1</sup> have first to be deflated by allowing the air to escape through the valve H and then the air tubes with their outer coverings B<sup>2</sup> E<sup>2</sup> will be free to be removed from the plates C and G and the latter may be removed from the sole A and heel F by taking out the screws d. In the way the plates and air tubes can be refixed on the shoe by first fixing the plates C and G by screws d and then placing the air tubes B<sup>1</sup> E<sup>1</sup> within their respective outer covering portions B<sup>2</sup> E<sup>2</sup> and then placing the outer covering portions in position on the plates so that the beaded edges of the outer covering engage under the edges of the plates as shewn; then when the air tubes B<sup>1</sup> E<sup>1</sup> are inflated the shoe will be ready for use.

It is evident that if desired a separate valve may be used for each air tube B<sup>1</sup> E<sup>1</sup> but it is preferred to employ one valve H which is common to both air tubes B<sup>1</sup> E<sup>1</sup> but it is not essential that if desired a separate valve may be used for each air tube B<sup>1</sup> E<sup>1</sup>.

The modification of my invention shown in the drawings is not intended to limit the scope of the invention to the particular construction of the shoe shown in the drawings but to cover all modifications of the shoe which may be made within the scope of the invention.

modification of my invention shewn by Figs. 4 and 5 the plates or shoes is moulded or otherwise made with an undercut groove  $a'$  sole and of similar shape to the groove  $c'$  in the plate C and in the  $a'$  fit the beaded edges  $b'$   $b''$  of the outer covering B' of the sole; and there is a similar groove  $f'$  running round the underside of the ribs  $f''$   $f'''$  for the beaded edges  $e'$   $e''$  of the outer covering B' so that the air tubes B' E' and their outer covering can be secured to the sole A and heel F when the inner air tubes described with reference to Figs. 1, 2 and 3

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Improvements in  
I, FREDERICK ROBINSON,  
Stafford, Engineer, do hereby  
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in and by the following state-

My invention has reference  
worn by athletes or by persons  
my invention is also applicable

My invention consists in the  
like flexible tubes to the sole  
tread, the said tubes being  
detachable and provided with  
at will.

The said pneumatic or inflated tubes  
soles and heels in the form of  
an undercut groove, or of  
an oblong or rectangular  
pneumatic groove, or of  
the outer covering, or of  
or ribs running  
therein. The tubes may be  
under the inner covering  
when inflated the sole and  
heel may be made elastic.

Or the sole and heel may be  
arranged to form an undercut  
edges of which may be  
undercut section.

When made of india rubber  
readily be removed so as to  
thus enabling the sole and  
pneumatic tube to be  
removed so as to be  
separately used.

Or the pneumatic tube  
heel of the shoe may be  
In order to be particularly  
which

Fig. 1 is a plan view of the  
india rubber sole and heel

Fig. 2 is a plan view of the  
removed so as to be  
separately used.

Fig. 3 is a plan view of the  
separately used.

Fig. 4 is a plan view of the  
pneumatic tube

Fig. 5 is a plan view of the  
invention and

Fig. 6 is a plan view of the  
part of the invention

Fig. 7 is a plan view of the  
to more clearly

Fig. 8 is a plan view of the  
tube fits;

Fig. 9 is a plan view of the  
pneumatic tube

Fig. 10 is a plan view of the  
shewn by the

In the modification of my invention shewn by Fig. 11, the coverings B<sup>2</sup> E<sup>2</sup> are each made with flanges as shewn, the covering B<sup>2</sup> is made with two flanges marked respectively a<sup>2</sup> and b<sup>2</sup> flat against the underside of the sole by the two plates I<sup>2</sup> conform with the shape of the sole and are fixed thereto by screws d<sup>2</sup> which are fixed flat against the underside of the heel by the plates J<sup>2</sup> J<sup>3</sup>, screws d<sup>2</sup> passing through these plates at intervals, the flanges a<sup>2</sup> b<sup>2</sup> and thus securing the air tube E<sup>1</sup> and its outer covering against the underside of the heel.

Having now particularly described and ascertained the nature of the invention and in what manner the same is to be performed, I wish to be understood that I am aware that prior to my said invention the soles of boots and shoes have been constructed so as to be inflated with air and therefore I claim as my exclusive right of so constructing the said soles and heels in the following manner, to-wit:

1. The application of round the under of inflatable india rubber or like sole and heels of boots and shoes or between the sole and heel so as to form an elastic tread substantially as hereinbefore described and illustrated in the accompanying drawings.

2. For boots and shoes the india rubber or other like flexible outer coverings B<sup>2</sup> of the air tubes made with beaded edges adapted to engage in the under recesses in the plates or in the sole and heel of the boots or shoes so as to be secured thereto by the inflating of the inner air tube substantially as hereinbefore set forth.

3. For boots and shoes the india rubber or other like flexible outer coverings B<sup>2</sup> of the air tubes made with flanges adapted to be fixed against the sole and heel of the boots or shoes by metal plates substantially as hereinbefore described in Figs. 6 and 7 of the accompanying drawings.

4. In boots and shoes making the india rubber or like soles and heels with undercut grooves such as a<sup>1</sup> f<sup>1</sup> for the beaded edges of the outer coverings of the inner air tubes to engage with substantially as hereinbefore described and illustrated by Figs. 4 and 5 of the accompanying drawings.

5. For securing the india rubber or other like flexible outer coverings and inner air tubes to the soles and heels of boots and shoes the thin sheet metal plates C and G made with their edges turned upwardly and inwardly so as to form undercut grooves for the beaded edges of the flexible outer coverings to engage with in the manner substantially as hereinbefore described and shewn.

6. For boots and shoes, the combination of the metal plate C made with an undercut groove, the outer covering B<sup>2</sup> made with beaded edges engaging in the undercut groove, and the inner air tube B<sup>1</sup> contained between the outer covering B<sup>2</sup> and the plate C the whole adapted for fixing to the sole of a boot or shoe so as to form an elastic tread substantially as hereinbefore set forth.

7. For boots and shoes, the combination of the metal plate G made with undercut grooves, the outer covering E<sup>2</sup> made with beaded edges engaging with the undercut grooves, and the inner air tube E<sup>1</sup> contained between the outer covering E<sup>2</sup> and the plate G the whole adapted for fixing to the heel of a boot or shoe so as to form an elastic tread substantially as hereinbefore set forth.

Dated this 3rd day of May 1894.

CHARLES BOSWORTH KETLEY  
Agent for the Applicant.

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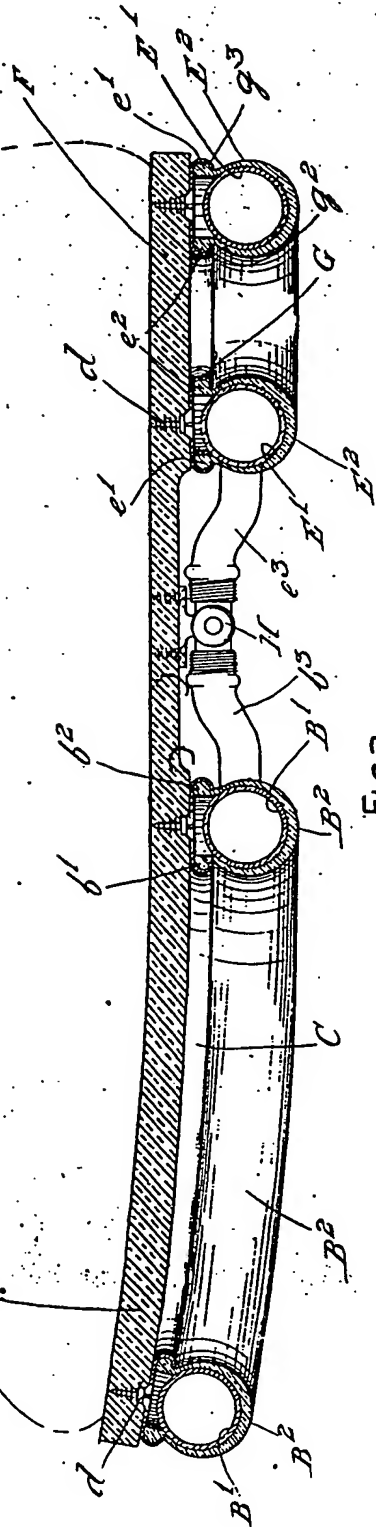
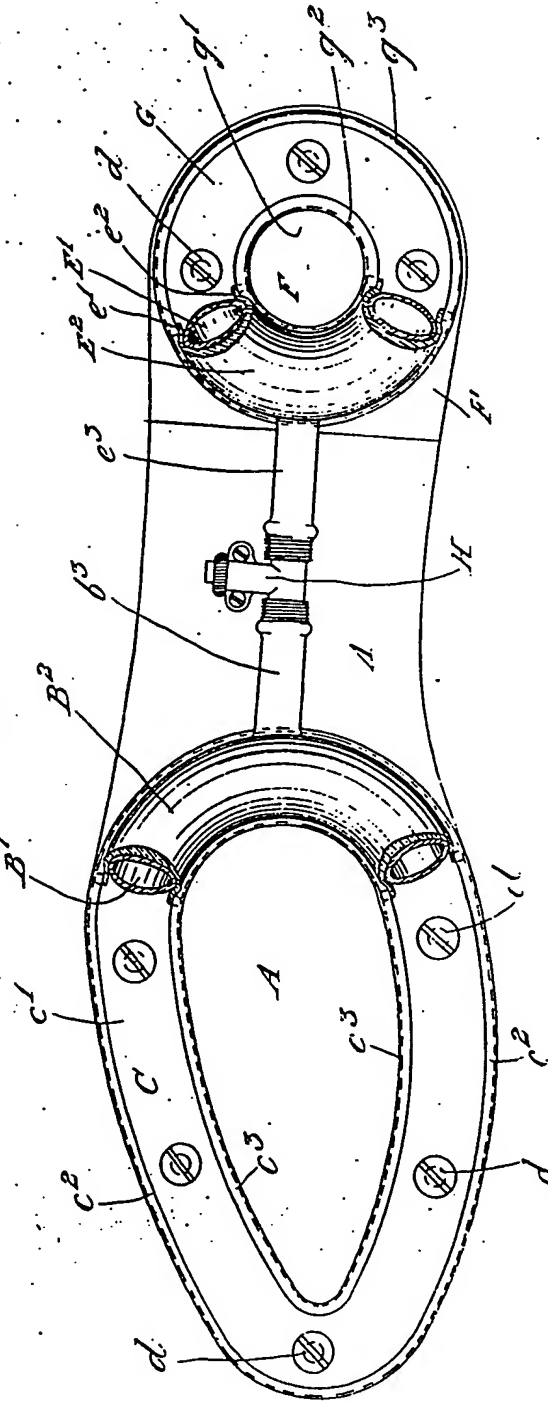


FIG. 1



N<sup>o</sup> 7441



A.D. 1906

Date of Application, 28th Mar., 1906

Complete Specification Left, 28th Sept., 1906—Accepted, 21st Mar., 1907

### PROVISIONAL SPECIFICATION.

#### Improvements in Boots and Shoes

I, ROBERT EDWARD CRETNEY, of 1, Market Hill, Douglas, Isle of Man, Bootmaker do hereby declare the nature of this invention to be as follows:—

The objects of this invention are to provide boots or shoes which shall be softer and more resilient to the feet than hitherto, which shall be capable of supporting the insteps, and which can be made to raise a foot further from the ground, as is sometimes desired.

I in carrying out the invention I form the inner sole with a hollow space or spaces or recess either at the front part, the waist, or the heel, or all of them. The hollow space may be grooved out of the material of the sole or may be formed by blocking over the edges or otherwise. Within the hollow space I dispose small airtight tubes or compartments which may be filled with air, preferably at pressure so as to render the boot very springy. The hollow space is covered in by an outer sole secured by sewing or otherwise preferably to the edges of the inner sole and such outer sole may when desired be formed with a hollow space blocked out or otherwise formed so as to raise the foot off the ground. By making the waist recess deep and the air tube large the in-step may be firmly supported without undue stiffness. The front part of the sole, the waist, and the heel may be formed in separate pieces sewed together, each or any of them having a hollow space therein as above mentioned. When air under pressure is used an inlet valve or valves to the air tube or tubes is used to allow the air to be forced in by a pump.

Dated this Twentyseventh day of March 1906.

W. B. JOHNSON,  
Agent.

25

### COMPLETE SPECIFICATION.

#### Improvements in Boots and Shoes

I, ROBERT EDWARD CRETNEY, of 1 Market Hill, Douglas, Isle of Man, Boot Maker do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement and annexed drawing forming a part of this specification.

The invention relates to boots of the well known type which have pneumatic compartments arranged in the soles and filled with air, under pressure and the objects are to provide boots or shoes which while being soft and resilient to the feet shall not be liable to excessive yielding on either side of the foot shall be stronger in construction, be capable of

*Credney's Improvements in Boots and Shoes.*

the instep, and which can be made to raise a foot further from the ground as is sometimes desired. In carrying out the invention I arrange the chambers so that at least two of them shall be disposed side by side laterally of the sole and independent of each other.

On the drawing Fig 1 is a longitudinal section and Fig 2 a plan of a boot 5 embodying my invention I form the inner sole *a* with hollow spaces or recesses *b*, *c*, *d*, at the front part waist and heel respectively. The two latter may if desired be omitted the sole being solid at those parts. The hollow spaces may be formed by blocking over the edges *e* of the sole, and sewing pieces *f*, thereto or they may be grooved out of a thick piece of leather. This 10 renders the boot of very firm construction. *g* is the outer sole secured by sewing or otherwise to the edges of the inner sole or as shown to a welt *k*, sewn to the inner sole. The sole *g*, may be a single sole or when the boot is for a person of unequal length of legs the sole may, as shown, be formed with a hollow space *i*, blocked or grooved out to any depth required to raise the 15 foot off the ground. The hollow space *i*, is provided with an airtight compartment *j* of rubber or other suitable material. *k* are airtight tubes or compartments of india-rubber or other suitable material independent of each other in the recesses *b*, *c*, *d*, which tubes are filled simultaneously but independently with air under pressure and render the boot very soft and springy 20 at least two of the tubes *k*<sup>1</sup> are arranged side by side laterally as shown so that pressure of the foot on one side cannot drive all the air to the other side of the boot. By making the waist recesses deep and the air tube large the instep may be firmly supported without any unduly stiffening the boot. The various tubes or compartments *j*, *k*, contain air under pressure supplied through 25 inlet valves *l*, and inlet tubes *m*, all of which latter lead to a common tube *n* to which a force pump may be connected so that the tubes may be filled simultaneously but independently with air under any desired pressure. Instead of having only two tubes *k*<sup>1</sup> arranged laterally several separate tubes or compartments may be so arranged in the front part *b* of the sole and dangerous 30 rocking of the foot in the boot by excessive yielding at the sides of the sole is prevented. *o* is the usual upper leather. I am aware that tubes or compartments filled with air under pressure or otherwise have been arranged in the soles of the boots and also that valves to enable such tubes to be inflated have been used and I do not make a broad claim thereto. 35

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:—

First. In combination in a boot or shoe an inner sole blocked or grooved out to provide one or more recesses several separate and independent airtight 40 tubes or compartments within the recesses at least two of the tubes or compartments being arranged side by side laterally and inflatable simultaneously, an outer sole secured to the edges of the inner sole and an inlet valve to each tube a compartment with branch tubes to the valves to admit air from a force pump at pressure substantially as and for the purposes set forth. 45

Second. In combination with the parts under the first claim an outer sole having a recess formed therein and an airtight tube or compartment within the recess substantially as set forth.

Dated this Twentyseventh day of September 1906.

W. B. JOHNSON, 50  
4 Clayton Square Liverpool.  
Agent.

Fig. 1

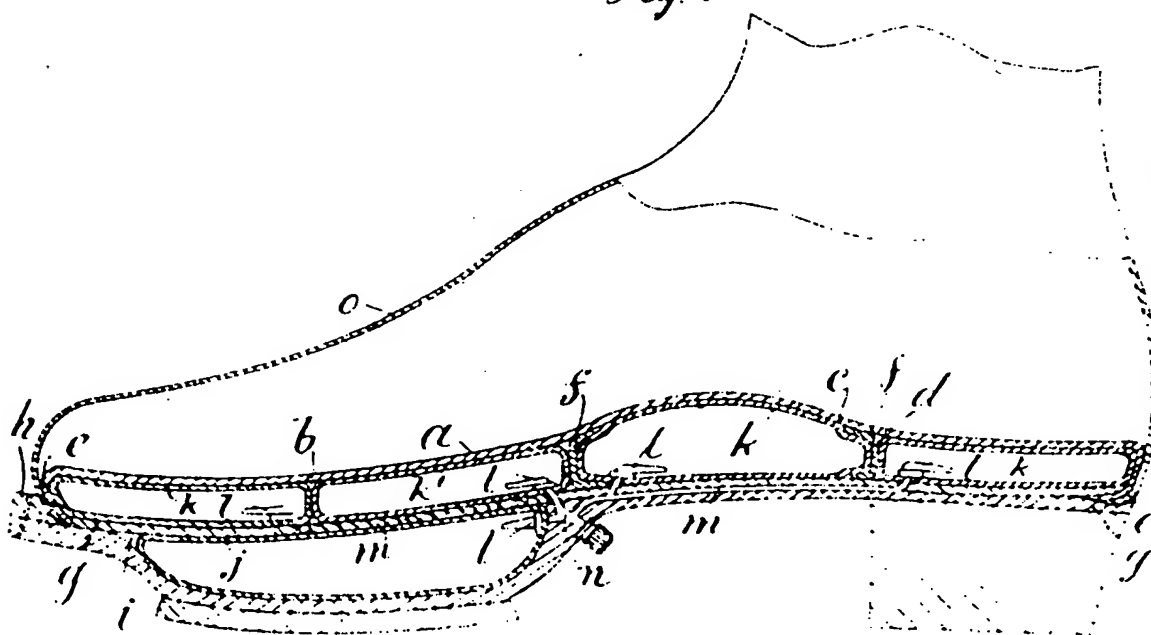
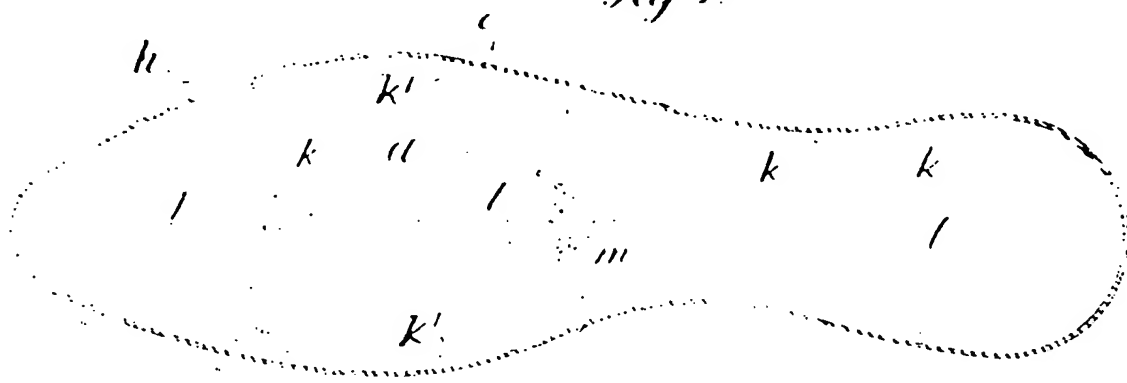


Fig. 2



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